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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/777,437 | 02/12/2004 | Larry Schoonover | ETS-0001 | 4781 |

26231 7590 05/26/2005

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| EXAMINER | |
|---|---|
| MASINICK, MICHAEL D | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2125 | |

DATE MAILED: 05/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/777,437 | SCHOONOVER, LARRY | |
| | Examiner | Art Unit | |
| | Michael D. Masinick | 2125 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *06 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 7-13* is/are rejected.

7)☒ Claim(s) *5 and 6* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 July 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2/12/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

Claims 1-13 are pending in this application.

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Examiner cannot ascertain the meaning of this claim as it is currently written. In looking to the specification for guidance, these terms of claim 11 are not used in the specification. Applicant should check the grammar of this claim to ensure that it is clear. This claim is not further treated on the merits.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4, 7-10, 12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,272,401 to Boger et al.

3. Referring to claim 1, 12, and 13, Boger shows a method of performing online valve diagnostics for a valve operating in a process, the method comprising: obtaining valve information while said valve operates in response to a control signal controlling said process, said valve operating through a series of gradual movements (Abstract – "The positioner system can diagnose the value while the valve process is running..."); said valve information including at least two of setpoint data, position data and pressure data (Col 1, lines 44-45); deriving at least one of step response, friction and spring range for said valve based on said valve information (Col 11, lines 52-58).

4. Referring to claim 2, Boger shows deriving a model of valve response to setpoint changes in response to said valve information ("intelligently monitors and adjusts..." – Col 9, lines 47-65); adjusting said model in response to error between predictions generated by said model and actual position information (Col 10); and applying a step input to model to generate a step response (Col 13, lines 23-30).

5. Referring to claim 3 and 4, Boger shows adjusting said model includes adjusting a first and second parameters affecting response time and overshoot (Column 10). Examiner notes that the wording of this claim can be interpreted in many different ways. Boger shows a way to adjust the BIAS variable, which would inherently have an affect on the response time and the overshoot (Column 24).

6. Referring to claims 7-11, Boger shows deriving a distribution of said position data by transforming said pressure data and said position data in response to a spring range of said valve;

determining friction of said valve in response to said distribution, determining friction includes determining a difference between an upper percentile and a lower percentile of said distribution, and wherein said upper percentile is 90 percent and said lower percentile is 10 percent (Column 13, lines 53-64).

### *Allowable Subject Matter*

7. Claims 5 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. While Boger shows all aspects of claims 1 and 2 on which these claims are dependant, neither this reference taken alone or in combination with the prior art of record disclose deriving said model includes taking a derivative of a setpoint data and taking a derivative of position data; solving for a set of coefficients that minimizes the error estimating said derivative of position data from said derivative of input data to define a wavelet; said applying said step input to said model includes integrating said wavelet; and deriving response time and overshoot from said step response or deriving said model includes obtaining plurality of wavelets in response to setpoint changes; said adjusting includes selecting one of said wavelets with minimal error; deriving a step response by applying said wavelet to an impulse; and deriving response time and overshoot from said step response.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael D. Masinick whose telephone number is (571) 272-3746. The examiner can normally be reached on Mon-Fri, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on (571) 272-3749. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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MDM

LEO PICARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

WHAT IS CLAIMED IS:

1. A method of performing online valve diagnostics for a valve operating in a process, the method comprising:

obtaining valve information while said valve operates in response to a control signal controlling said process, said valve operating through a series of gradual movements;

said valve information including at least two of setpoint data, position data and pressure data;

deriving at least one of step response, friction and spring range for said valve based on said valve information.

2. The method of claim1 further comprising:

deriving a model of valve response to setpoint changes in response to said valve information;

adjusting said model in response to error between predictions generated by said model and actual position information; and

applying a step input to model to generate a step response.

3. The method of claim 2 wherein:

adjusting said model includes adjusting a first parameter affecting response time.

4. The method of claim 3 wherein:

adjusting said model includes adjusting a second parameter affecting overshoot.

5. The method of claim 2 wherein:

said deriving said model includes taking a derivative of a setpoint data and taking a derivative of position data;

solving for a set of coefficients that minimizes the error estimating said derivative of position data from said derivative of input data to define a wavelet;

said applying said step input to said model includes integrating said wavelet; and

deriving response time and overshoot from said step response.

6. The method of claim 2 wherein:

said deriving said model includes obtaining plurality of wavelets in response to setpoint changes;

said adjusting includes selecting one of said wavelets with minimal error;

deriving a step response by applying said wavelet to an impulse; and

deriving response time and overshoot from said step response.

7. The method of claim 1 further comprising:

deriving a distribution of said position data by transforming said pressure data and said position data in response to a spring range of said valve;

determining friction of said valve in response to said distribution.

8. The method of claim 7 wherein:

said determining friction includes determining a difference between an upper percentile and a lower percentile of said distribution.

9. The method of claim 8 wherein:

said upper percentile is 90 percent and said lower percentile is 10 percent.

10. The method of claim 7 wherein:

said deriving said distribution includes projecting position data to a pressure axis along a slope corresponding to said spring range.

11. The method of claim 1 further comprising:

deriving a plurality of distributions of said position data in response to a plurality spring ranges of said valve;

selecting one of said spring ranges in response to variance of said plurality of distributions.

12. A system for deriving valve characteristics of a valve operating in a process, the system comprising:

a process controller generating control signals to operate said valve through a series of gradual movements;

a positioner receiving said control signals and generating a signal for positioning said valve;

a controller receiving valve information from said positioner, said valve information including at least two of setpoint data, position data and pressure data;

said controller deriving at least one of step response, friction and spring range for said valve based on said valve information.

13. A storage medium encoded with machine-readable computer program code for deriving valve characteristics of a valve operating in a process, the storage medium including instructions for causing a controller to implement a method comprising:

obtaining valve information while said valve operates in response to a control signal

controlling said process, said valve operating through a series of gradual movements;

said valve information including at least two of setpoint data, position data and pressure data;

deriving at least one of step response, friction and spring range for said valve based on said valve information.